



STEAM Art Science Lab: Creative Experiments in Nature

1 hour · Pre-K – 8th · After School · Teacher: Chigusa Kanzan

Instructions: This lesson plan is your starting point — feel free to edit, rearrange, or customize it to fit your teaching style and your students' needs! These notes are yours. They will not be published anywhere.

Topics Covered

Scientific observation · Art techniques · Nature patterns · Color theory · Creative experimentation · STEAM integration

Lesson Plan

1. Welcome & Wonder Question (5 min)

- Gather students in a circle and introduce the day's theme with an intriguing question (e.g., 'Why do snowflakes have six sides?' or 'How do butterflies get their colors?')
- Show a visual example (photo, specimen, or artwork) related to the session's focus
- Have students share one thing they notice or wonder about the example
- Explain the day's creative experiment and what students will discover

2. Science Observation Station (15 min)

- Set up observation stations with magnifying glasses, specimens, or materials related to the theme (leaves, crystals, insect photos, water droplets, etc.)
- Guide students to observe closely and sketch what they see in their science journals, noting patterns, colors, textures, and shapes
- Prompt specific observations: 'Count the petals,' 'Trace the veins,' 'What patterns repeat?'
- Have students share one surprising detail they discovered with a partner

3. Art-Science Experiment (25 min)

- Introduce the hands-on creative experiment (e.g., chromatography butterflies, salt crystal paintings, shadow tracing, color mixing like nature)
- Demonstrate the technique step-by-step, explaining the science behind what's happening
- Students work on their individual projects, experimenting with materials and documenting results
- Circulate to ask guiding questions: 'What happens if you add more water?' 'How does this compare to what we observed?'
- Encourage students to try variations and make predictions

4. Movement Break: Nature in Motion (5 min)

- Lead a themed movement activity related to the day's topic
- Students move like growing plants, fluttering butterflies, light rays bouncing, or crystals forming
- Incorporate counting, patterns, or sequences into the movement

5. Share & Reflect Circle (10 min)

- Students display their artwork and gather in a circle for a gallery walk
- Each student shares one thing they learned and one thing that surprised them
- Connect observations back to the original wonder question
- Teacher summarizes key science concepts discovered through the art process
- Preview next week's theme to build excitement

Materials Checklist

- ☐ Magnifying glasses (1 per 2-3 students)
- ☐ Science journals or sketchbooks (1 per student)
- ☐ Pencils, colored pencils, markers, watercolors
- ☐ Natural specimens or high-quality photos (weekly theme-specific: leaves, flowers, crystals, insects, etc.)
- ☐ Weekly experiment materials (salt, coffee filters, food coloring, cotton swabs, oil pastels, etc.)
- ☐ Paper towels and water cups
- ☐ Trays or plates for organizing materials
- ☐ Camera or tablet for documenting student work (optional)

Age Adaptations

Younger Kids: Pre-K through 2nd grade: Use larger specimens and simpler observation prompts. Provide pre-drawn templates or outlines for art projects. Focus on sensory exploration and basic patterns. Use more demonstration and guided instruction. Keep vocabulary simple and use lots of visual examples. Allow more free exploration time and less structured journaling.

Older Kids: 5th through 8th grade: Introduce scientific vocabulary and concepts (symmetry, photosynthesis, molecular structure, light refraction). Require detailed sketches with labels in journals. Add measurement and data collection components. Encourage hypothesis formation before experiments. Include research elements where students investigate why patterns occur. Challenge students to design their own variations on experiments and document results scientifically.

Movement Break

Play 'Pattern Freeze Dance' where students move freely to music, but when the music stops, they must freeze in a symmetrical pose or create a repeating pattern with their body (arms making spirals, legs in a zigzag, etc.). Teacher can call out specific patterns: 'Freeze in radial symmetry!' or 'Make a bilateral pattern!'

Bonus Activities

- Create a STEAM lab museum display corner where students can showcase their favorite work from the series
- Start a nature pattern scavenger hunt list where students photograph or sketch patterns they find at home between sessions
- Offer advanced students a 'Scientist Challenge Card' with an extra experiment variation to try
- Provide art technique cards for early finishers to practice skills like stippling, cross-hatching, or blending

Series Outline (11 Weeks)

Week	Theme	Key Activities
1	Leaf Science: Veins, Patterns & Chlorophyll	Observe leaf structures with magnifying glasses and sketch vein patterns, Create leaf rubbings and prints to study textures and shapes, Experiment with chromatography to separate leaf pigments using coffee filters and rubbing alcohol
2	Crystal Gardens: Geometry in Nature	Examine crystal photos and identify geometric shapes (hexagons, cubes, pyramids), Grow salt or sugar crystals on paper and observe formation over time, Paint crystalline patterns using watercolors and salt technique to create texture

Week	Theme	Key Activities
3	Butterfly Wings: Symmetry & Color Science	Study butterfly wing patterns and identify bilateral symmetry, Create symmetrical butterfly prints using paint and paper folding, Explore color mixing science by experimenting with primary colors to match butterfly hues
4	Flower Power: Petal Patterns & Pollination	Dissect flowers (or observe closely) to count petals and identify parts, Sketch flowers focusing on radial symmetry and Fibonacci spirals, Create pressed flower art or botanical watercolor paintings
5	Light & Shadow: How Light Behaves	Experiment with flashlights, prisms, and objects to create shadows and rainbows, Trace shadow outlines at different angles and observe how light direction changes shapes, Create silhouette art or light-reflection paintings using metallic paints
6	Weather Wonders: Clouds, Rain & Rainbows	Observe cloud photos and learn cloud types (cumulus, cirrus, stratus), Create a rain cloud in a jar experiment using shaving cream and food coloring, Paint watercolor skiescapes experimenting with wet-on-wet technique for cloud effects
7	Tree Rings & Wood Grain: Nature's Time Capsule	Examine tree cross-sections or photos and count rings to determine age, Create wood grain texture art using combs or tools dragged through paint, Learn about tree growth and create a 'life story' artwork showing rings representing student's life events
8	Insect Investigation: Patterns, Camouflage & Adaptation	Study insect photos focusing on patterns (stripes, spots, warning colors), Discuss camouflage and adaptation science concepts, Design and draw imaginary insects with specific adaptations for different environments
9	Ocean Waves: Motion & Patterns in Water	Observe videos or images of wave patterns and learn about wave motion science, Create wave bottles with oil, water, and food coloring to study liquid behavior, Paint ocean scenes using layering techniques to show wave movement and depth
10	Microscopic Worlds: Seeing the Invisible	View microscope slides or magnified images of everyday materials (salt, fabric, paper), Sketch magnified textures and patterns found in common objects, Create abstract art inspired by microscopic imagery using stippling, dots, and tiny repeated shapes
11	STEAM Showcase: Student-Designed	Students choose a natural pattern or science concept from the series to explore further, Work on a culminating art-science project combining

Week	Theme	Key Activities
	Experiments	observation, experimentation, and creativity, Present projects in a mini science-art fair format, explaining their process and discoveries to peers



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